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Sir:

I am filing herewith a United States Patent Application of:

Inventor: Charles Litvin
Title: INSULATED BOX FAN

The complete application includes the following:

- | | |
|--------------------------------|-------------------------|
| (6) Pages Specification; | (5) Claims; |
| (1) Page Abstract; | Dec./Power of Attorney; |
| (6) Page Drawing (triplicate); | Post Card Receipt. |

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Please address all communications to the following correspondence address:

ZACHARY T. WOBENSMITH, III
86 THE COMMONS AT VALLEY FORGE EAST
1288 VALLEY FORGE ROAD
P.O. BOX 750
VALLEY FORGE, PA 19482-0750
TELEPHONE: (610) 935-9750

Direct all inquiries to the undersigned attorney.

Zachary T. Wobensmith
ZACHARY T. WOBENSMITH, III
Attorney for Applicant
PTO Reg. No. 26,524

CHARLES LITVIN

INSULATED BOX FAN

BACKGROUND OF THE INVENTION

FIELD OF THE INVENTION

This invention relates to an insulated box fan of the type wherein the motor is electrically insulated from the rest of the fan by an isolator ring.

DESCRIPTION OF THE PRIOR ART

Box fans are perhaps the most common fan in the industry. Historically, box fans are constructed of metal and plastic and are one of the least expensive fans, they provide a high volume of air, are of relatively light weight, are sturdy and long lasting, are versatile in that they can be placed on virtually any flat surface, and are stable and resist toppling.

With the use in fans of six pole motors and the increasing use of four pole motors, which use capacitors and consequent higher operating voltages, problems can arise if the fan is placed into a window, and the air being moved by the fan becomes moisture laden air, or if water comes directly onto the fan.

One of the problems from moisture laden air is that the water may provide a current leakage path to parts of the fan that come into contact with the user.

Box fans typically mount the motor, which has a metal outer casing, directly to vertical metal brackets in the fan, so that if the motor casing is electrically charged, the fan housing will also become charged, and present a hazard to the user.

The fan of the invention is designed to isolate the motor housing from the fan mounting brackets to prevent the fan housing from becoming electrically charged, and provides other positive advantages.

SUMMARY OF THE INVENTION

It has now been found that an insulated box fan is available, wherein the fan motor is electrically insulated from the fan housing by an isolator ring.

The principal object of the invention is to provide a box fan that has a fan motor that is electrically insulated from the fan housing.

A further object of the invention is to provide a box fan that is simple and inexpensive to construct.

A further object of the invention is to provide a box fan which maintains the mechanical and structural integrity of the metal bracket portion of the fan.

A further object of the invention is to provide a box fan wherein the basic fan housing structure is not modified, and which provides a slim streamlined box fan.

A further object of the invention is to provide a box fan that can be safely placed in a window.

A further object of the invention is to provide a box fan with improved air flow to the fan motor for better cooling.

Other objects and advantageous features of the invention will be apparent from the description and claims.

DESCRIPTION OF THE DRAWINGS

The nature and characteristic features of the invention will be more readily understood from the following description taken in connection with the accompanying drawings forming part hereof in which:

Fig. 1 is a front view of a box fan which incorporates the invention;

Fig. 2 is a fragmentary rear view of one embodiment of a portion of the box fan of Fig. 1;

Fig. 3 is a vertical sectional view, taken approximately on the line 3-3 of Fig. 2;

Fig. 4 is a front view of an isolator ring of the fan of Fig. 3;

Fig. 5 is a view similar to Fig. 2, illustrating another embodiment of a portion of a box fan;

Fig. 6 is a horizontal sectional view, taken approximately on the line 6-6 of Fig. 5; and

Fig. 7 is a front elevational view of an isolator ring used in the fan illustrated in Fig. 5.

It should, of course, be understood that the description and drawings herein are merely illustrative and that various modifications and changes can be made in the structures disclosed without departing from the spirit of the invention.

Like numerals refer to like parts throughout the several views.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

When referring to the preferred embodiments, certain terminology will be utilized for the sake of clarity. Use of such terminology is intended to encompass not only the described embodiment, but

also technical equivalents which operate and function in substantially the same way to bring about the same result.

Referring now more particularly to Figs. 1-4, inclusive, a box fan 10 is illustrated which has a front grill 11, an outer rectangular fan housing 12, a fan motor 14, with a fan hub 15, and a plurality of fan blades 16 extending therefrom.

The front grill 11 is preferably of molded synthetic plastic and the fan housing 12 is preferably of stamped metal.

A rear grill (not shown) would also be provided, which could have a design similar to front grill 11.

The fan housing 12 has a pair of spaced vertical brackets 20 extending from the top 21 of the housing 12 to the bottom 22, which brackets 20 are preferably of metal, to add strength and rigidity to the fan housing 12.

The embodiment of fan motor 14 illustrated in detail in Figs. 2 and 3 is a six (6) pole motor, which has a front casing 23 and a rear casing 24.

The rear casing 24 is of dish shape with a plurality of radial cutouts 25.

An isolator ring 30 is provided, which is of molded plastic, with polypropylene plastic being the preferred material.

The isolator ring 30 is of dish shape, open in the center 31, and includes a rim 32 with projections 33, four being shown, and spaced with two at the top and two at the bottom.

The motor casing 24 is attached to rim 32 by four screws 34, which extend through rim 32 into threaded openings (not shown) in casing 24.

The rim 32 has openings 35 at the top and bottom with locating pins 36 therein, which extend from motor casing 24.

The projections 33 have screws 37 engaged therein, four being illustrated, which screws extend through openings (not shown) in brackets 20, retaining ring 30 thereto.

Referring now more specifically to Figs. 5-7 inclusive, another embodiment of the invention is illustrated, with a four (4) pole motor 40, which includes a front dish shaped casing 41, and a rear dish shaped casing 42.

The motor 40 has an output shaft 43 with a blade hub 45 thereon.

An isolator ring 50 is provided, which is of molded plastic with polypropylene plastic being preferred.

The ring 50 has a wide rim 51, with spaced openings 52, which have screws 53 therein, four being illustrated, which extend therethrough into threaded openings 54 in casing 42 to retain motor 40 thereon.

The configuration of the rim 51 has been found to better direct the air to cool the motor than with previous structures, and it has been found that the operating temperature of the fan motor may be lowered by as much as 2.5 degrees centigrade by use of the ring 50.

The rim 51 has four spaced 57 bosses thereon, which have openings 58 therein, and as shown in Figs. 5,6, have screws 59 therein, which screws 59 extend through openings (not shown) in the brackets 20 of a fan housing (not shown) similar to that described above, to retain the motor 40 thereon. While at least two screws are shown in each bracket 20, variations can be used where the bracket could have an opening (not shown), which would have a tab

(not shown) from the ring 50 engaged therein, and one screw 59.

It will thus be seen structure has been provided with which the objects of the invention are achieved.

I claim:

1. A box fan which includes a rectangular metal outer housing, at least one grill on said housing, a pair of spaced vertical metal brackets connected to said housing, the improvement which comprises an electrically insulating ring connected to said metal brackets, and

a fan motor connected to said insulating ring.

2. A box fan as defined in claim 1 in which said fan motor has a front casing and a rear casing, said ring is connected to said fan motor rear casing by at least one screw, which passes through said ring into said rear casing, and

said ring is connected to said brackets by at least two screws, which pass through said brackets and are engaged in said ring.

3. A box fan as defined in claim 1 in which said ring is of molded plastic.

4. A box fan as defined in claim 1 in which said ring is of circular configuration.

5. A box fan as defined in claim 1 in which said ring has rim means to direct cooling air to said fan motor to reduce its operating temperature.

[illegible][illegible]

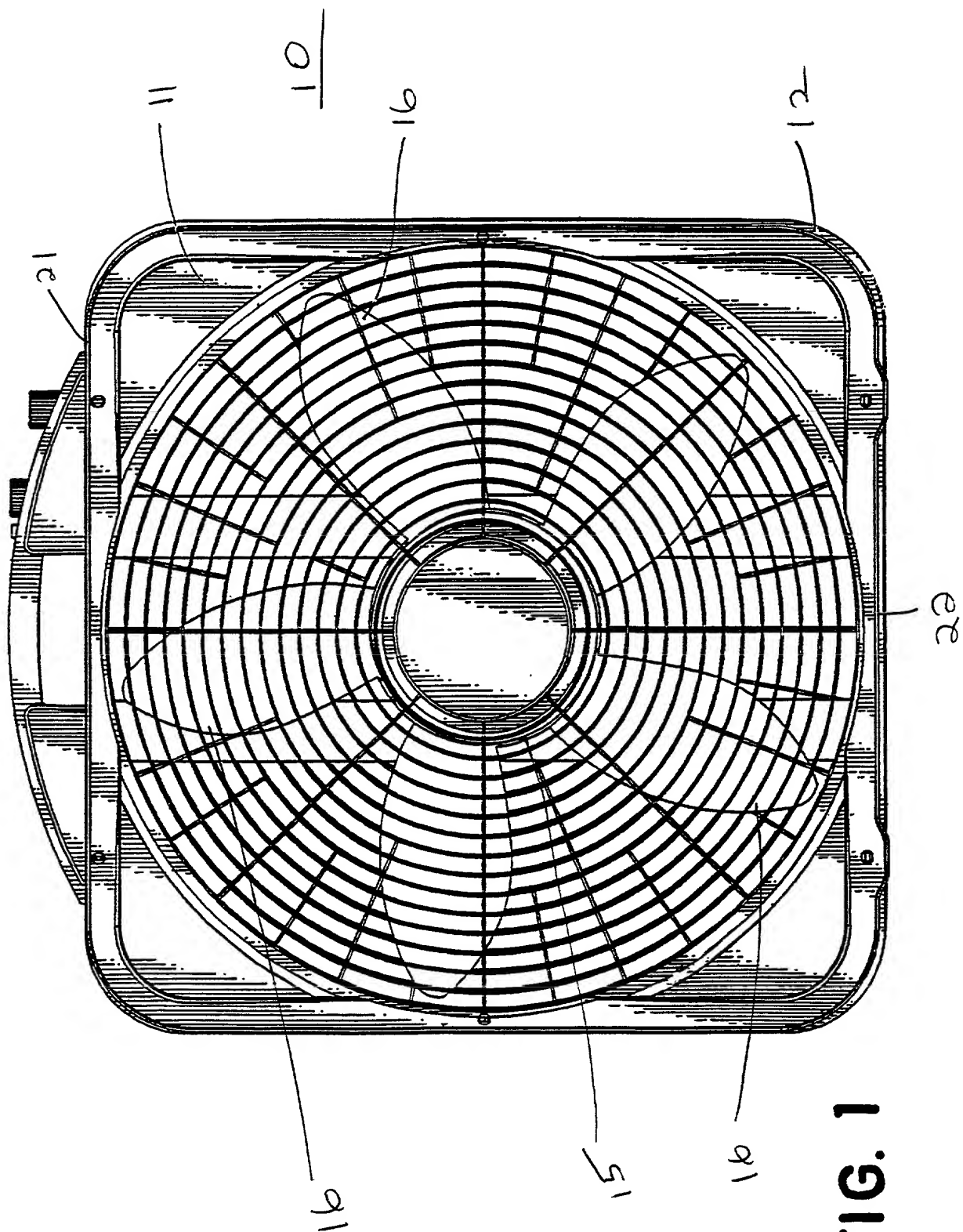


FIG. 1

FIG 2

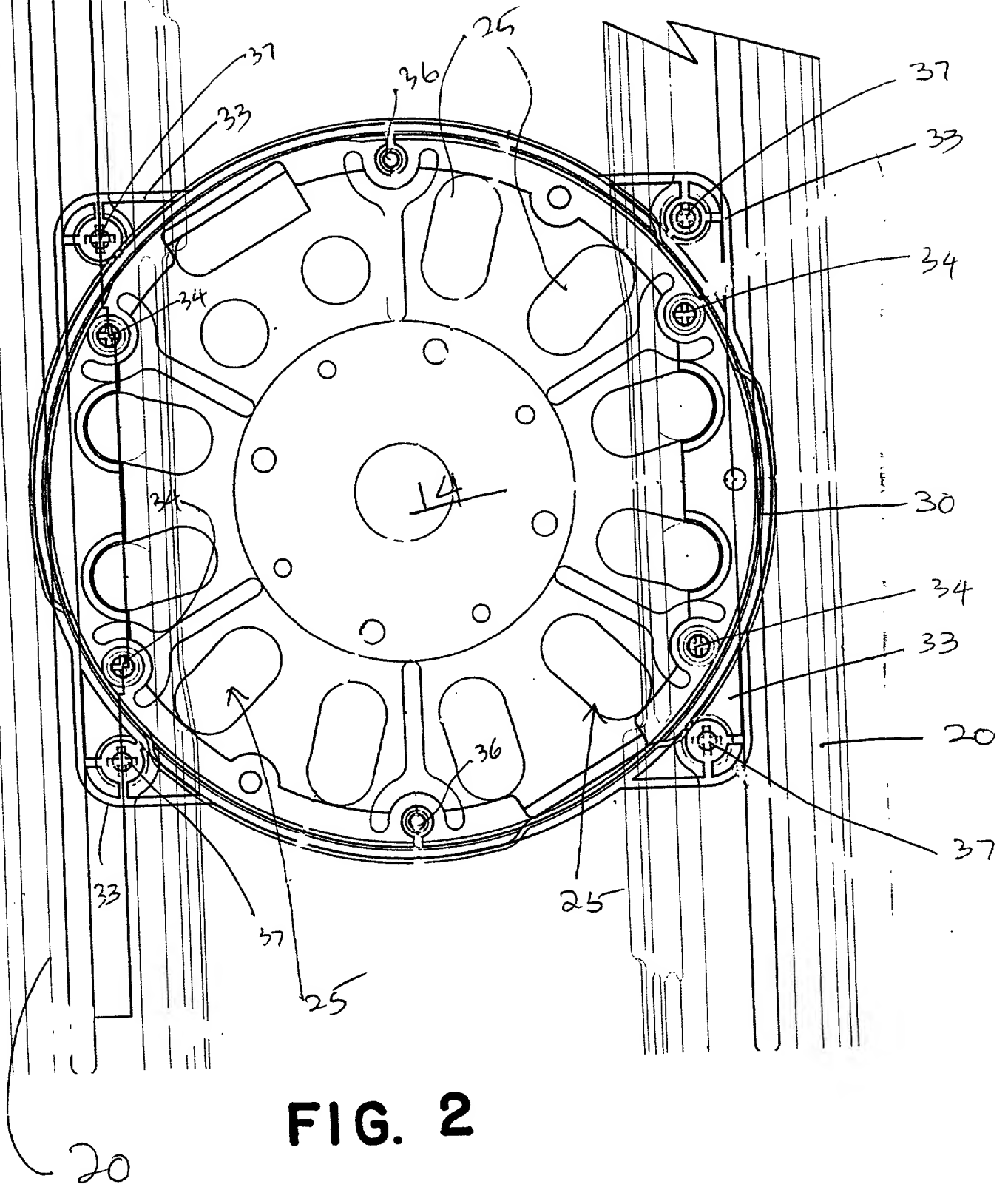
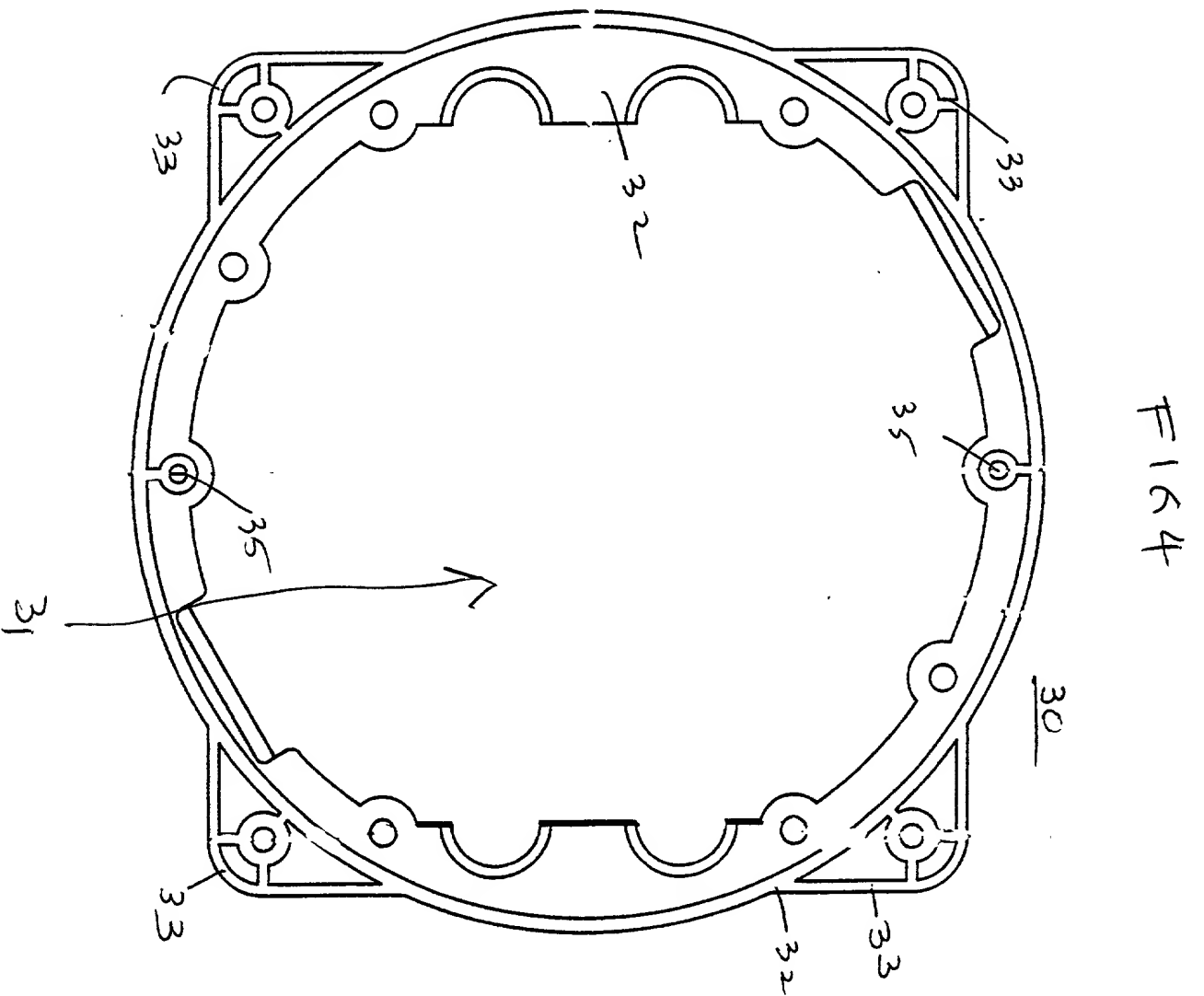
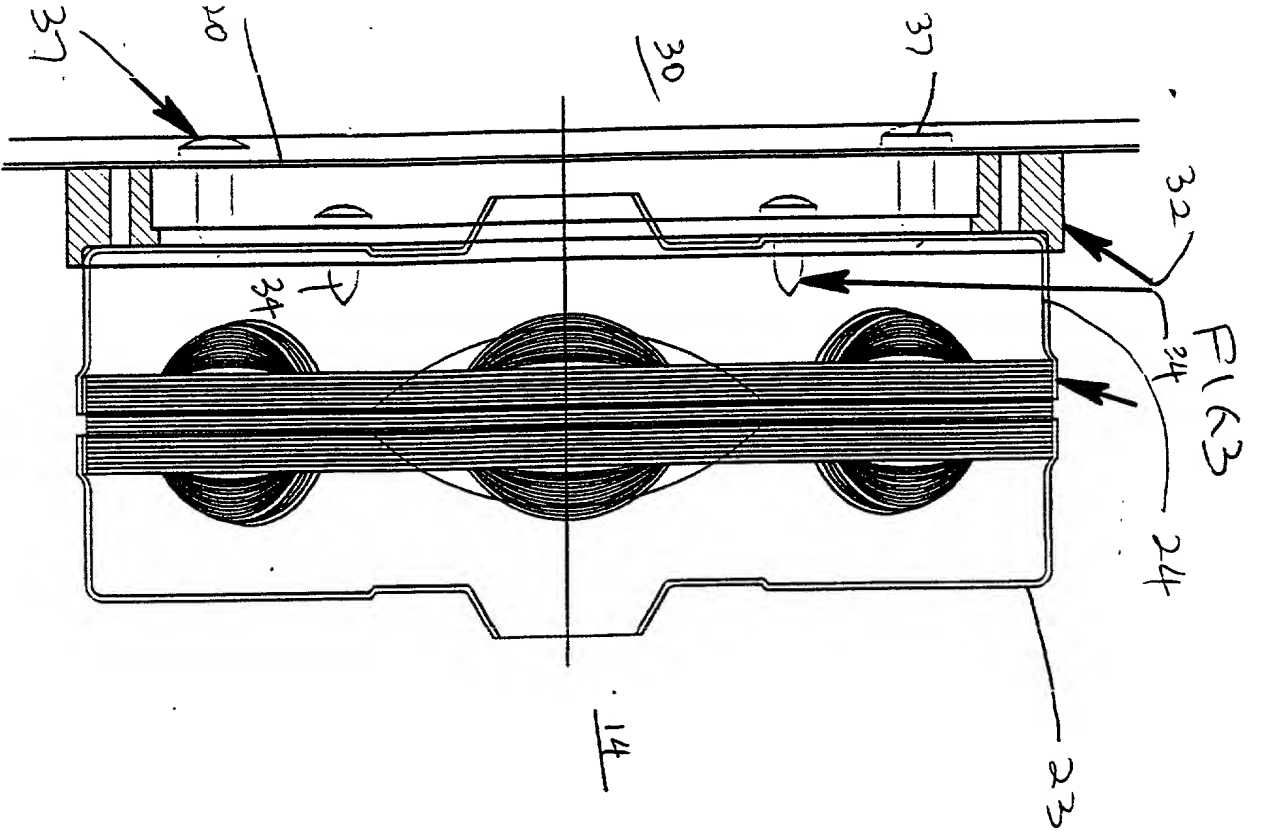


FIG. 2



F14, 5

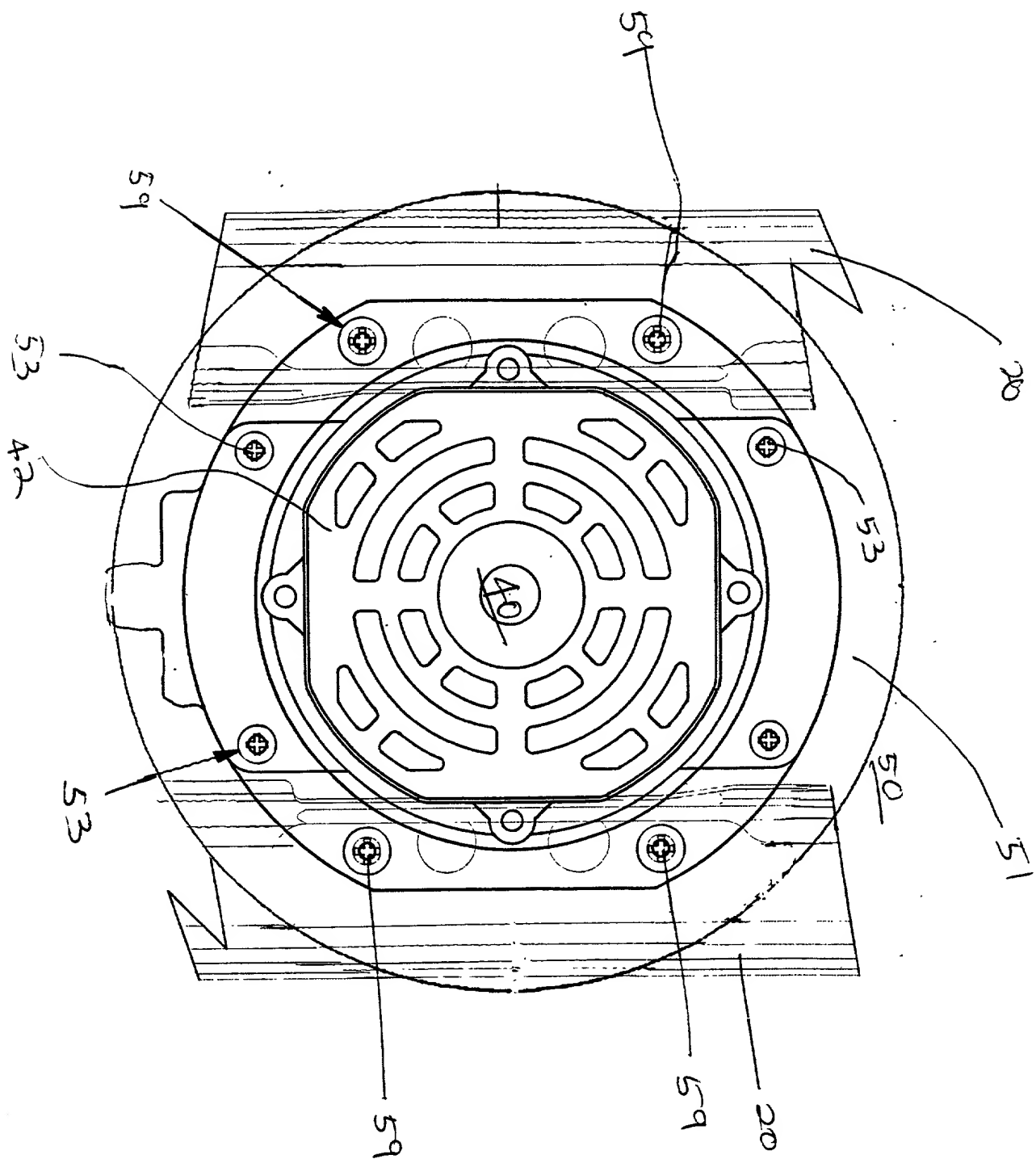


FIG. 6

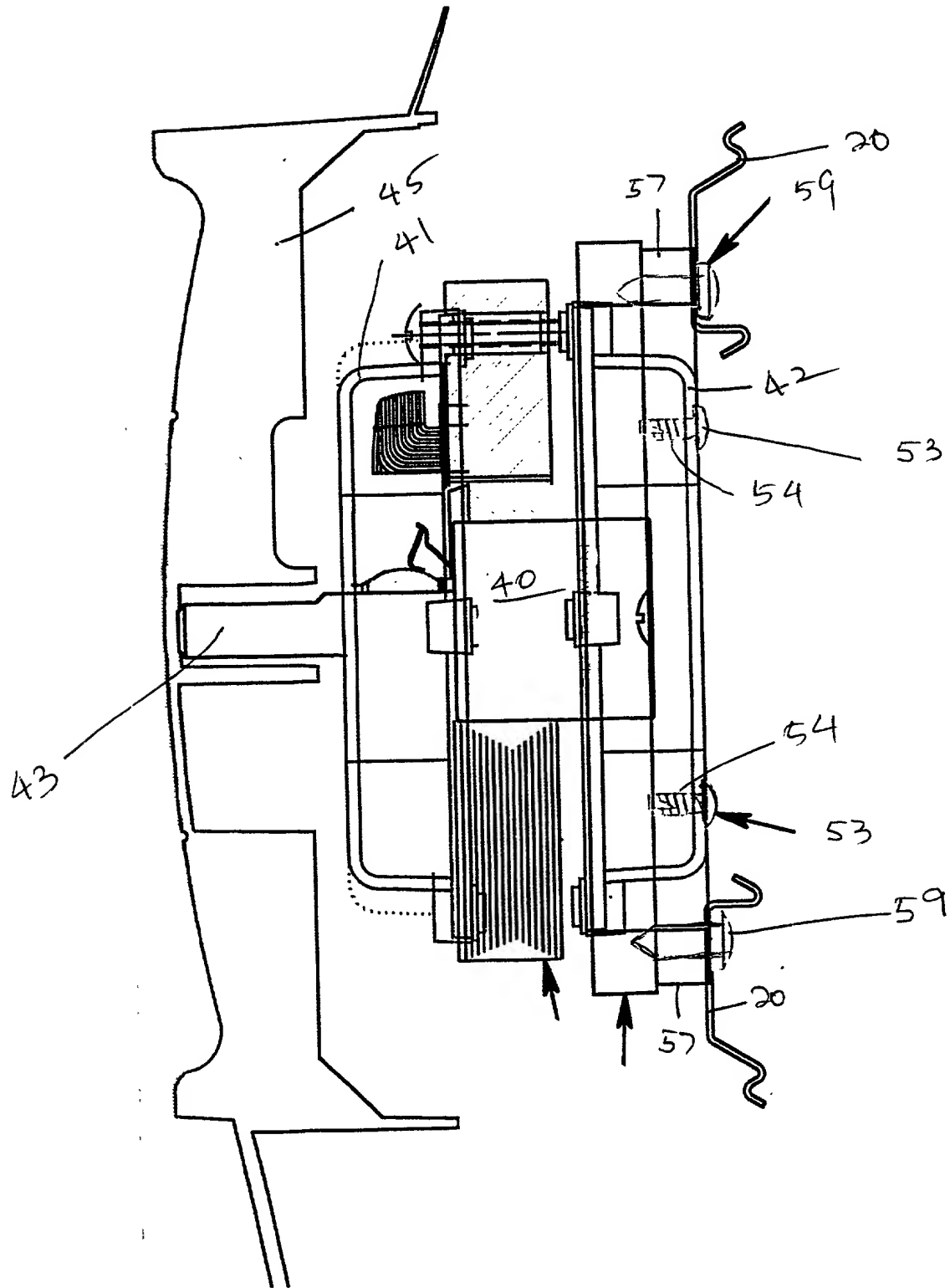
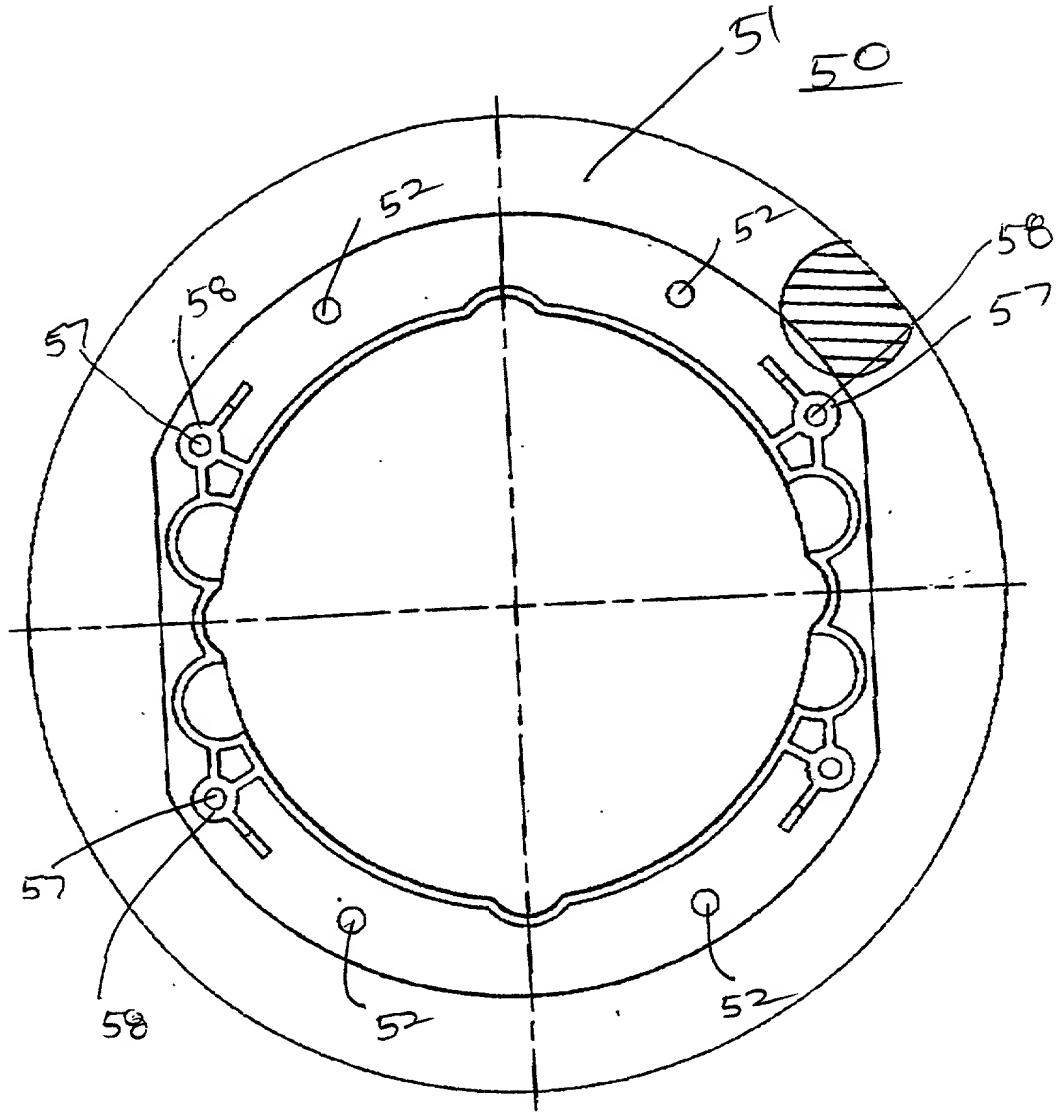


FIG. 7



Original U.S.
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DECLARATION, POWER OF ATTORNEY AND POWER TO INSPECT

As a below named inventor, I hereby declare:

that my residence, post office address and citizenship are as stated below next to my name;

that I verily believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural inventors are named below) of the utility entitled INSULATED BOX FAN

the specification of which [check one(s) applicable]

 was filed as PCT International/U.S. Application No.
and was amended by Amendment filed (if applicable); [or]
☒ is attached to this Declaration, Power of Attorney and Power to Inspect;

that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above; and

that I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Rule 56(a) [37CRF§1.56(a)]

POWER OF ATTORNEY: As Inventor, I hereby appoint **ZACHARY T. WOBENSMITH, III**, Reg. NO. 26,524 of Valley Forge, Pennsylvania, as my attorney with full power of substitution to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith;

POWER TO INSPECT: I hereby give **ZACHARY T. WOBENSMITH, III**, of Valley Forge, Pennsylvania or his duly accredited representatives power to inspect and obtain copies of the papers on file relating to this application.

SEND CORRESPONDENCE TO : **ZACHARY T. WOBENSMITH, III**
86 The Commons at Valley Forge East
1288 Valley Forge Road
P.O. Box 750
Valley Forge, PA 19482-0750

DIRECT PHONE CALLS:

(610) 935-9750

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

SOLE OR FIRST JOINT INVENTOR

Full Name CHARLES LITVIN
First Middle Last
Signature [Signature]
Date 12/02/1999
Residence West Chester, PA
City State or Country
Citizenship U.S.A.
Country
Post Office Address
c/o Lasko Metal Products
820 Lincoln Ave., Box 891
West Chester, PA 19380-0294
City State or Country Zip Code

THIRD JOINT INVENTOR (IF ANY)

Full Name _____
First Middle Last
Signature _____
Date _____
Residence _____
City State or Country
Citizenship _____
Country
Post Office Address _____
City State or Country Zip Code

SECOND JOINT INVENTOR (IF ANY)

Full Name _____
First Middle Last
Signature _____
Date _____
Residence _____
City State or Country
Citizenship _____
Country
Post Office Address _____

City State or Country Zip Code

FOURTH JOINT INVENTOR (IF ANY)

Full Name _____
First Middle Last
Signature _____
Date _____
Residence _____
City State or Country
Citizenship _____
Country
Post Office Address _____
City State or Country Zip Code